ALGEBRA III
WS – GEOMETRIC SEQUENCES & SERIES

NAME_____
PER___DATE_____

Tell whether each sequence is arithmetic, geometric, or neither

1) 2, 10, 50, 250

2) 5, 1, -3, -7

3) $\frac{2}{3}, 1, \frac{3}{2}, \frac{9}{4}$

4) 5, 6, 8, 11, 15

Find the common ratio and the next 2 terms of the geometric sequence

5) 2, 6, 18, _____, _____

6) 120, 60, 30, _____, _____

7) 4, -8, 16, _____, _____

8) $\frac{1}{27}, \frac{1}{9}, \frac{1}{3}$, _____, _____

Find the first 4 terms of each geometric sequence

9) $a_1 = 3$, $r = 5$

10) $a_1 = 7$, $r = -2$

11) $a_1 = 12$, $r = \frac{1}{2}$

12) $a_1 = \frac{1}{8}$, $r = 4$

Write a rule for the nth term of the geometric sequence

13) 4, 12, 36, 108, ...

14) 5, 25, 125, 625, ...

15) 6, -30, 150, -750, ...

16) 136, 68, 34, 17, ...

17) $a_1 = -\frac{1}{2}$, $r = 4$

18) $a_1 = -2$, $r = -8$

Write the first 4 terms of each geometric sequence

19) $a_n = 3^n$

20) $a_n = 4(5)^{n-1}$

21) $a_n = 5(-2)^{n-1}$

22) $a_n = 48\left(\frac{1}{2}\right)^{n-1}$

Find the indicated term

23) a_6 if $a_1 = 3$, r = 2

24) a_8 if $a_1 = -\frac{1}{4}$, r = -2

25) a_5 if $a_1 = 243$, $r = -\frac{1}{3}$

26) a_{10} if $a_1 = \frac{1}{24}$, r = 2

Find the missing numbers in each geometric sequence

27) 3, _____, _____, _____, 48

28) -12, _____, _____, 96

29) 5, _____, _____, 135, _____

30) 81, _____, _____, _____, 1

Find the sum of each of the following

31) 1 + 3 + 9 + 27 + ... (8 terms)

32) 8 + 4 + 2 + ... (6 terms)

33) $\frac{1}{9} - \frac{1}{3} + 1 - \ldots$ (5 terms)

34) $a_1 = 7$, r = 2, n = 10

35) $a_1 = 243$, $r = -\frac{2}{3}$, n = 5

36) $a_1 = 7$, $a_n = 700$, r = 10

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Tell whether each sequence is arithmetic, geometric, or neither

1) 2, 10, 50, 250 geo $r=5$

2) 5, 1, -3, -7 arith $d=-4$

3) $\frac{2}{3}, 1, \frac{3}{2}, \frac{9}{4}$ geo $r=\frac{3}{2}$

4) 5, 6, 8, 11, 15 neither

Find the common ratio and the next 2 terms of the geometric sequence

5) 2, 6, 18, 54, 162 $r=3$

6) 120, 60, 30, 15, 7.5 $r=\frac{1}{2}$

7) 4, -8, 16, -32, 64 $r=-2$

8) $\frac{1}{27}, \frac{1}{9}, \frac{1}{3}, 1, 3$ $r=3$

Find the first 4 terms of each geometric sequence

9) $a_1 = 3$, $r = 5$

3, 15, 75, 375

10) $a_1 = 7$, $r = -2$

7, -14, 28, -56

11) $a_1 = 12$, $r = \frac{1}{2}$

12, 6, 3, 1.5

12) $a_1 = \frac{1}{8}$, $r = 4$

$\frac{1}{8}, \frac{1}{2}, 2, 8$

Write a rule for the nth term of the geometric sequence

13) 4, 12, 36, 108, ...

$a_n = 4(3)^{n-1}$

14) 5, 25, 125, 625, ...

$a_n = 5(5)^{n-1} = 5^n$

15) 6, -30, 150, -750, ...

$a_n = 6(-5)^{n-1}$

16) 136, 68, 34, 17, ...

$a_n = 136\left(\frac{1}{2}\right)^{n-1}$

17) $a_1 = -\frac{1}{2}$, $r = 4$

$a_n = -\frac{1}{2}(4)^{n-1}$

18) $a_1 = -2$, $r = -8$

$a_n = -2(-8)^{n-1}$

Write the first 4 terms of each geometric sequence

19) $a_n = 3^n$

3, 9, 27, 81

20) $a_n = 4(5)^{n-1}$

4, 20, 100, 500

21) $a_n = 5(-2)^{n-1}$

5, -10, 20, -40

22) $a_n = 48\left(\frac{1}{2}\right)^{n-1}$

48, 24, 12, 6

Find the indicated term

23) a_6 if $a_1 = 3$, $r = 2$

24) a_8 if $a_1 = -\frac{1}{4}$, $r = -2$

25) a_5 if $a_1 = 243$, $r = -\frac{1}{3}$

26) a_{10} if $a_1 = \frac{1}{24}$, $r = 2$

Find the missing numbers in each geometric sequence

27) 3, _____, _____, _____, 48

28) -12, _____, _____, 96

29) 5, _____, _____, 135, _____

30) 81, _____, _____, _____, 1

Find the sum of each of the following

31) 1 + 3 + 9 + 27 + ... (8 terms)

32) 8 + 4 + 2 + ... (6 terms)

33) $\frac{1}{9} - \frac{1}{3} + 1 - \ldots$ (5 terms)

34) $a_1 = 7$, $r = 2$, $n = 10$

35) $a_1 = 243$, $r = -\frac{2}{3}$, $n = 5$

36) $a_1 = 7$, $a_n = 700$, $r = 10$